

GAS TURBINE FULL POWER MEMO EXAMPLE

FROM: COMMANDING OFFICER, ____ (SHIP) ____
TO: SENIOR ENGINEER, BOARD OF INSPECTION AND SURVEY, ATLANTIC

SUBJ: FULL POWER TRIAL

REF: (A) EOSS (IF APPLICABLE)
(B) GAS TURBINE FULL POWER PMS MRC
(C) OPNAVINST 9094.1B
(D) INSURVINST 4730.1B
(E) NSTM CH. (GAS TURBINES)
(F) (APPLICABLE PROPULSION PLANT TECH MANUAL)
(G) (PROPULSION OPERATING GUIDE)

ENCL: (1) FULL POWER BUILD-UP PROCEDURES AND PROCEDURES FOR QUICK REVERSAL
DEMONSTRATIONS
(2) SHIP'S LOADING DATA AND FULL POWER AHEAD/ASTERN CALCULATIONS
(3) PROPULSION MACHINERY LIMITING PARAMETERS

1. IN ACCORDANCE WITH REFERENCES (A) THROUGH (G) A FULL POWER TRIAL WILL BE CONDUCTED ON ____ (DATE). THE DURATION OF THE FULL POWER TRIAL WILL BE ONE HOUR.
2. THE COMMUNICATIONS SYSTEM USED TO COORDINATE THE COLLECTION OF DATA WILL BE THE ____ (MC), ____ (PHONE CIRCUIT) _____. DATA AT ALL STATIONS WILL BE RECORDED AT THE COMMENCEMENT OF THE TRIAL AND AT 15 MINUTE INTERVALS THEREAFTER. ONE SET OF READINGS WILL ALSO BE TAKEN AT FULL POWER ASTERN OPERATION.
3. THE SHIP WAS UNDOCKED ON ____ (DATE) _____.
4. THE SHIP'S LAST FULL (COMPLETE) WATERBORNE HULL CLEANING WAS COMPLETED ON ____ (DATE) _____.
5. THE FOLLOWING EQUIPMENT IS NOT ALIGNED IN ACCORDANCE WITH REFERENCES (A) THROUGH (H).

<u>EQUIPMENT/SYSTEM</u>	<u>PLANT IMPACT</u>	<u>DFS/STANDING ORDER NUMBER</u>
--------------------------------	----------------------------	---

6. THERE IS NO MACHINERY OUT OF COMMISSION THAT WILL ADVERSELY AFFECT THE OPERATION OF THE MAIN PROPULSION PLANT DURING THE FULL POWER TRIAL. (IF THERE IS ANY OUT OF COMMISSION MACHINERY THAT WILL EFFECT THE FULL POWER TRIAL LIST THEM):

<u>EQUIPMENT</u>	<u>PLANT IMPACT</u>	
-------------------------	----------------------------	--

7. USS _____ IS READY IN ALL ASPECTS TO CONDUCT THE SUBJECT TRIAL.

COMMANDING OFFICER

FULL POWER BUILD-UP PROCEDURES AND PROCEDURES FOR QUICK REVERSAL

1. PRIOR TO COMMENCEMENT OF THE FULL POWER TRIAL THE SHIP WILL BE UNDERWAY WITH THE FOLLOWING PRINCIPLE PROPULSION PLANT MACHINERY IN OPERATION:

(LIST MAIN PROPULSION PLANT EQUIPMENT LINEUP HERE)

- THE FOLLOWING PRINCIPLE AUXILIARY EQUIPMENT IN OPERATION

- _____ FUEL OIL SERVICE PUMP(S)
- _____ LUBE OIL PURIFIER(S)
- _____ HPAC(S)
- _____ LPAC(S)
- _____ AUXILIARY MACHINERY COOLING WATER PUMP(S)
- _____ MAIN CONDENSATE PUMP(S)
- _____ SSDG(S), GTG(S) AND ASSOCIATED PUMPS(S)
- _____ GEAR DRIVEN LUBE OIL SERVICE PUMP(S)
- _____ ELECTRIC LUBE OIL SERVICE PUMP(S) (STATUS)
- _____ DISTILLING UNIT(S) AND ASSOCIATED PUMP(S)

2. SHAFT(S) WILL BE BROUGHT UP TO FULL POWER SRPM AND PITCH, SEE ENCLOSURE (2), IN STANDARD SPEED INCREMENTS, ALLOWING APPROXIMATELY __ (TIME) __ BEFORE EACH SPEED INCREASE.

3. ONCE THE SHAFT(S) HAS/HAVE REACHED FULL POWER AND HAS/HAVE MAINTAINED REQUIRED SRPM AND PITCH FOR _____ MINUTES, AND THE CHIEF ENGINEER AND INSURV SENIOR ENGINEER AGREE, THE TIMED FULL POWER RUN WILL COMMENCE. DATA WILL BE COLLECTED AT THE COMMENCEMENT AND EVERY 15 MINUTES THEREAFTER FOR ONE HOUR. ALL PROPULSION AND AUXILIARY PLANT PARAMETERS WILL BE RECORDED AND PROVIDED TO THE INSURV SENIOR ENGINEER UPON COMPLETION. MANUAL AND AUTOMATED DATA WILL BE COLLECTED TO MEET THE REQUIREMENTS OF THE ENGINEERING TRIAL REPORT CONTAINED IN OPNAVINST 9094.1B FORM 9094/1D.

4. UPON COMPLETION OF ONE HOUR AT REQUIRED SRPM AND PITCH THE SHIP WILL CONDUCT FULL POWER AHEAD RUDDER SWING CHECKS.

5. UPON COMPLETION OF AHEAD FULL POWER RUDDER SWING CHECKS, THE SHIP WILL CONDUCT A QUICK REVERSAL FROM FULL POWER AHEAD TO FULL POWER ASTERN. FULL POWER ASTERN OPERATION WILL LAST FOR APPROXIMATELY 15 MINUTES. ONE ADDITIONAL SET OF READINGS WILL BE TAKEN WHEN THE PLANT HAS STABILIZED. THE QUICK REVERSAL WILL BE CONDUCTED IN STRICT ACCORDANCE WITH EOSS OR OTHER APPLICABLE PROPULSION PLANT MANUALS. THE THROTTLE CHANGE SHALL BE CONDUCTED IN ONE FLUID MOTION.

6. AFTER COMPLETION OF THE ASTERN FULL POWER TRIAL, THE SHIP WILL CONDUCT FULL POWER ASTERN RUDDER SWING CHECKS. MAXIMUM ASTERN RPM FOR RUDDER SWING CHECKS IS _____ RPM.

7. UPON COMPLETION OF ASTERN FULL POWER STEERING/RUDDER SWING CHECKS, THE SHIP WILL CONDUCT A QUICK REVERSAL FROM FULL POWER ASTERN TO FULL POWER AHEAD AND RETURN TO THE CALCULATED FULL POWER AHEAD SRPM/PITCH. IN ACCORDANCE WITH REFERENCE (), THE SHIP WILL MAINTAIN CALCULATED FULL POWER AHEAD SRPM FOR A MINIMUM OF FIVE MINUTES.

8. THE ENGINEER OFFICER OR ANY INSURV INSPECTOR WILL TERMINATE THE FULL POWER TRIAL IF, AT ANY TIME, THE PERFORMANCE/DATA IS QUESTIONABLE OR CONDITIONS EXIST THAT MAY ENDANGER EQUIPMENT OR PERSONNEL SAFETY.

ENCLOSURE (1)

SHIP'S LOADING DATA AND FULL POWER AHEAD/ASTERN CALCULATIONS

1. SHIP'S LOADING DATA

A. LIQUID LOAD (MAXIMUM)

FUEL OIL	100%	_____
DIESEL OIL	100%	_____
FRESHWATER	100%	_____
FEEDWATER	100%	_____
LUBE OIL	100%	_____
BALLAST	100%	_____

B. DRAFT AT NOMINAL DISPLACEMENT

FORWARD:

AFT:

MEAN:

DESIGN DISPLACEMENT: (TONS)

DESIGN DRAFT: (NAVIGATIONAL DRAFT)

C. LIQUID LOAD AT COMMENCEMENT OF TRIAL

FUEL OIL	_____
DIESEL OIL	_____
FRESHWATER	_____
RESERVE FEEDWATER	_____
LUBE OIL	_____
BALLAST	_____

D. PERCENT OF MAXIMUM LIQUID LOAD: _____% (MIN OF 75% PER OPNAVINST 9094)

E. MINIMUM DEPTH REQUIRED = $\frac{(10) \times (H) \times (V)}{L}$

WHERE: D = MINIMUM DEPTH (FEET)

H = TRIAL DEPTH (FEET)

V = SPEED OF RUN (KNOTS)

L - SQUARE ROOT OF LENGTH BETWEEN PERPENDICULARS (FEET)

2. REQUIRED FULL POWER SHAFT HORSEPOWER (SHP)/RPM IS:

3. REQUIRED FULL POWER ASTERN SHP/RPM IS:

ENCLOSURE (2)

MAIN PROPULSION MACHINERY LIMITING PARAMETERS

<u>COMPONENT/SYSTEM</u>	<u>FULL POWER DESIGN PARAMETER</u>	<u>MIN/MAX/ALARM SET POINT</u>	<u>REFERENCE</u>
GG RPM	RMP	RPM	
GTE TORQUE	FT LBS	FT LBS	
TORQUE SPLIT MAX	FT LB	FT LBS	
ENGINE VIBRATION NGG	MILS	MILS	
NPT	MILS	MILS	
GAS GEN PRESS RATIO	PSI	PSI	
SHAFT PITCH	FT (AHEAD)	FT (AHEAD)	
	FT (ASTERN)	FT (ASTERN)	
SHAFT RPM	RPM	RPM	
SHAFT TORQUE	FT LBS	FT LBS	
SHAFT HORSEPOWER	SHP	SHP	
MAIN RED GEAR LO PRESS	PSI	PSI	
MOST REMOTE BEARING	PSI	PSI	
RED GEAR BEARING TEMP	DEGREES	DEGREES	
LINE SHAFT BEARING TEMP	DEGREES	DEGREES	
LUBE OIL COOLER OUTLET	DEGREES	DEGREES	
LUBE OIL HEADER TEMP	DEGREES	DEGREES	
GTE INLET TEMP	DEGREES	DEGREES	
GTE INLET PRESSURE	PSI	PSI	
CDP	PSI	PSI	
PT INLET PRESSURE	PSI	PSI	
FUEL MANIFOLD PRESSURE	PSI	PSI	
PT INLET TEMP	DEGREES	DEGREES	
PT RPM	RPM	RPM	
PT RPM (TORQUE COMPUTER)	FT LBS	FT LBS	
PLA	PERCENT	PERCENT	
PT TORQUE	FT LBS	LBS	

LM2500 GTB INSPECTIONS:

	<u>HOURS</u>	<u>CONDUCTED</u>	<u>INSPECTION INTERVAL</u>	<u>DUE</u>	<u>CURRENT</u>
1A: GGA:					
GTB 22:					
GTB 24:					
1A: PTA:					
GTB 12:					
1B: GGA:					
GTB 22:					
GTB 24:					
1B: PTA:					
GTB 12:					

NOTE: INCLUDE 2A/2B AS REQUIRED